Missouri Public Service Commission

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October 8, 1999

FILED
OCT 8 1999
Missouri Public
Service Commission

Mr. Dale Hardy Roberts
Secretary/Chief Regulatory Law Judge
Missouri Public Service Commission
P. O. Box 360
Jefferson City, MO 65102

RE: Case No. ES-99-581 - Kansas City Power & Light Company

Dear Mr. Roberts:

Enclosed for filing in the above-captioned case are an original and fourteen (14) conformed copies of an **INCIDENT INVESTIGATION INTERIM REPORT.**

This filing has been mailed or hand-delivered this date to all counsel of record.

Thank you for your attention to this matter.

Sincerely yours,

Lera L. Shemwell By SD

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Assistant General Counsel
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LLS/wf
Enclosure
cc: Counsel of Record

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company Regarding an Incident at the Hawthorn Station, Kansas City, Missouri, on February 17, 1999.	))))	Case No. ES-99-581

INCIDENT INVESTIGATION INTERIM REPORT

Boiler No. 5 Damage
Hawthorn Plant
Kansas City, Missouri
February 17, 1999

Prepared by the Staff of the
Missouri Public Service Commission

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Dated: October 9, 1999

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Incident Investigation
Interim Report

Introduction and Summary

This interim report contains the facts of the incident known as of October 4, 1999. No conclusions or recommendations have been included, because the investigations by Kansas City Power and Light (KCPL) and the insurance investigation team from Crawford Investigation Services (CIS) are not complete. The Staff of the Missouri Public Service Commission (Staff) will continue to follow the investigation and will file a final report with the Commission when all the information is available.

Preliminary indications from KCPL's investigation are that a natural gas explosion occurred which destroyed Hawthorn #5 Boiler.

At the time of the explosion there were a total of seventeen (17) people on site. There were no OSHA reportable injuries due to the explosion. The boiler was not operating at the time of the explosion.

Damaged Area

An explosion occurred at approximately 12:30 a.m. on February 17, 1999, which destroyed Boiler No. 5 at the KCPL Hawthorn Power Plant. (See photographs 1 and 2, Appendix A). The explosion also destroyed the structural steel supporting the boiler, as well as all equipment located in the boiler building. (See photographs 3, 4, 5 and 6, Appendix A). In addition to the boiler, the explosion damaged the coal bunkers and the supporting structural steel, the two precipitators and the associated ductwork, and miscellaneous structures located outside of the boiler building. (See photographs 7, 8 and

9, Appendix A). At this time, KPCL does not believe the turbine and the turbine auxiliary equipment in the turbine building experienced any major damage. The turbine is scheduled to be opened up for inspection in October 1999, to determine if any internal damage was done. Other equipment will be inspected as part of the new boiler startup process.

Personnel Injuries

At the time of the explosion, the boiler was off line for repairs. There were fourteen (14) KCPL employees and three (3) non-KCPL employees on site. KCPL has reported to the Staff that no OSHA reportable injuries occurred due to the explosion. KCPL maintenance personnel were investigating a problem with a trip relay in the control system. The non-KCPL personnel were contract workers hired by KCPL to repair a leak in the shell of No. 4 low pressure (LP) feedwater heater.

Status of Investigation

Preliminarily, KCPL's investigation into the incident indicates that an explosion of natural gas occurred. CIS has not released any preliminary findings of their investigation. Both KCPL and CIS are reviewing data from the control-room data acquisition system, as well as other materials, in an attempt to determine the cause of the explosion.

Utility power boilers are normally designed with numerous interlocks to prevent natural gas or other fuels from entering the boiler at an improper time and creating a hazardous situation. These interlocks are sometimes incorporated into a common control

system called a burner management system. The KCPL and CIS investigation teams are reviewing the burner management system operation along with the data from the control-room data acquisition system to determine how natural gas might have entered the boiler, and what might have sparked the explosion.

The destroyed boiler and associated structural steel have been removed. The coal and gas burners, gas piping, and all but one of the gas valves have been recovered and are in storage (See photographs 10 and 11, Appendix A), available for the investigation teams to examine.

Data Acquisition System

All of the data was successfully downloaded from the control-room data acquisition system on June 5, 1999. The time period of the data retrieved from the data acquisition system was from midnight on November 30, 1998, through 12:30 a.m. on February 17, 1999. Copies were made of the downloaded data so both KCPL and CIS could begin their independent review of this data. Staff was on site to witness the process of downloading the data. The delay in accessing the data acquisition system was due, in part, to the limited access to the control-room because of the instability of the coal bunkers and the associated structural steel located above the control room area. (See photograph 7 and 8, Appendix A). Also, because the data acquisition system was physically removed from the control-room, time was needed to develop the protocol and obtain facilities necessary to re-power the computer in order to download the data properly without losing any of the data. As of October 4, 1999, both KCPL and CIS are continuing to review the data from the data

acquisition system to determine what events occurred prior to the explosion, and, if possible, the cause of the explosion. KCPL estimates their cost for the investigation, as of the end of August 1999, to be approximately $123,000.

Site Cleanup

The coal bunkers and the supporting structural steel have been removed. (See photographs 12 and 13, Appendix A). The damaged precipitator ductwork has been removed. During the demolition of the boiler building and cleanup of the turbine building, all of the asbestos in these facilities was either removed or abated.

The removal of the existing coal pulverizer equipment and structural steel required for the new boiler structure has been completed.

The estimated cost for the removal of the destroyed plant and asbestos is $3.9 million as of September 7, 1999.

Replacement Power

Since February, KCPL has been utilizing other KCPL generating units, as well as making purchases of energy in the available market, to cover the loss of Hawthorn #5. After KCPL determines a total energy replacement cost it will be made available to Staff.

Damage Repairs

KCPL plans to install a new coal fired boiler on the same site in order to use some of the existing equipment, such as the turbine and the stack, that was not destroyed by the

explosion. Work has begun at the plant for the installation of this new coal fired boiler. Most of the old foundations are being removed in order to install the new foundation to accommodate the new boiler. (See photograph 14 and 15, Appendix A). KCPL estimates the cost of a new replacement boiler to be approximately $273 million, with a not-to-exceed estimate of $340 million. KCPL notes that these costs do not include insurance cost recovery because estimates of insurance cost recovery are not available at this time.

Staff Investigation

The Staff has made eight (8) trips to the Hawthorn Plant since the explosion. Staff was on site initially within nine (9) days after the explosion. The Staff waited for KCPL's initial abatement of the asbestos and the securing of a safe area around the plant due to structural instability before visiting the site. During subsequent trips Staff has reviewed the status of the cleanup, and monitored the continuing investigation.

Staff has submitted initial data requests and has received responses from KCPL. KCPL has informed Staff that when the investigation has been completed, a final report of the results of the investigation will be made available to Staff. The Staff will continue to monitor the status of the investigation, review additional information as it becomes available, make regular visits to the site to discuss the investigation with KCPL personnel, and will file a formal incident report with the Commission as soon as a final report is possible. The final analysis of this incident is not complete at this time, and, due to the nature of the incident, may not be completed within 120 days of this interim report filing.

Staff will file either a final incident report within 120 days of the date of this report, or file another interim report if the investigation is not complete.

Submitted by the Staff of the Missouri Public Service Commission.

APPENDIX A

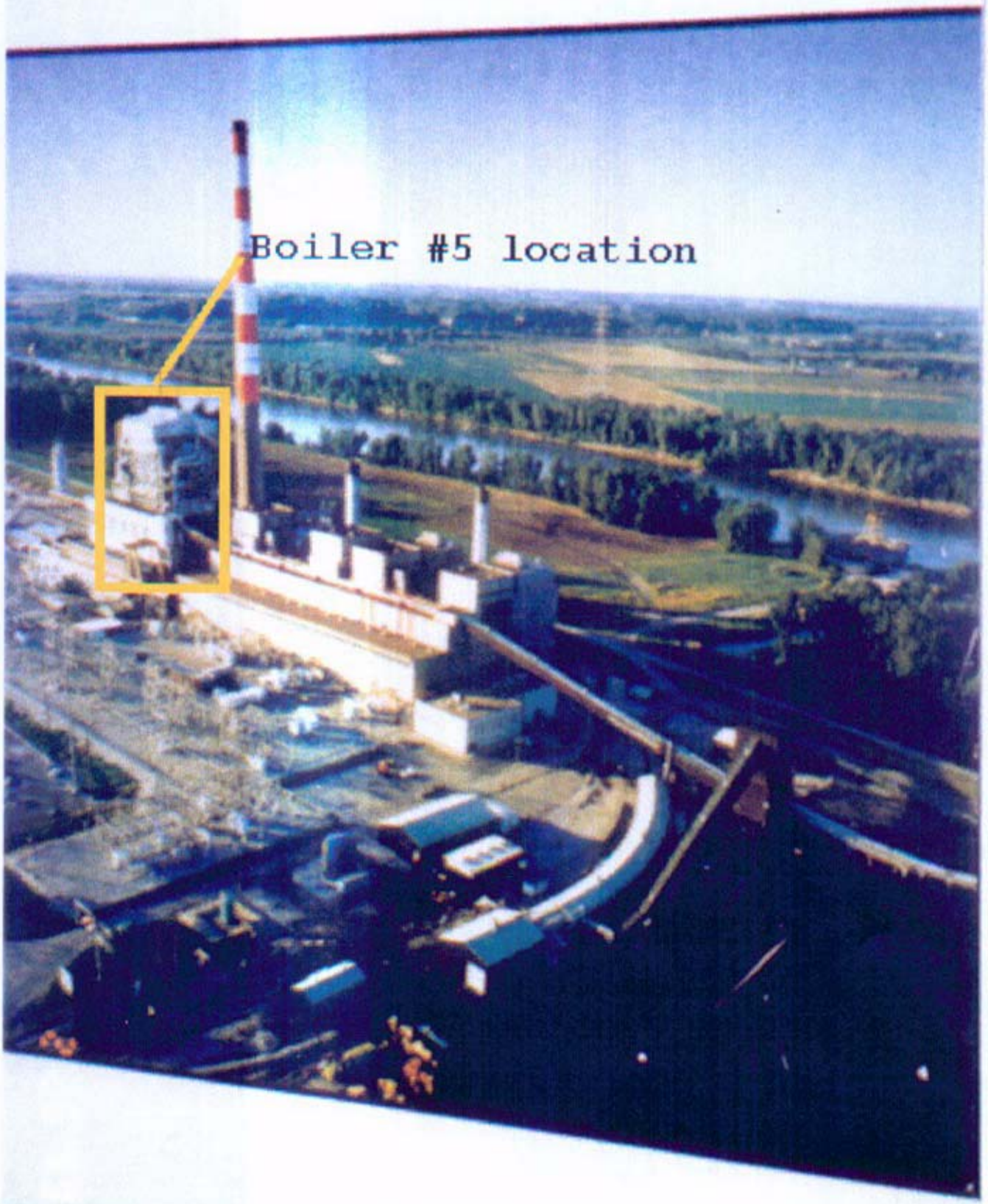
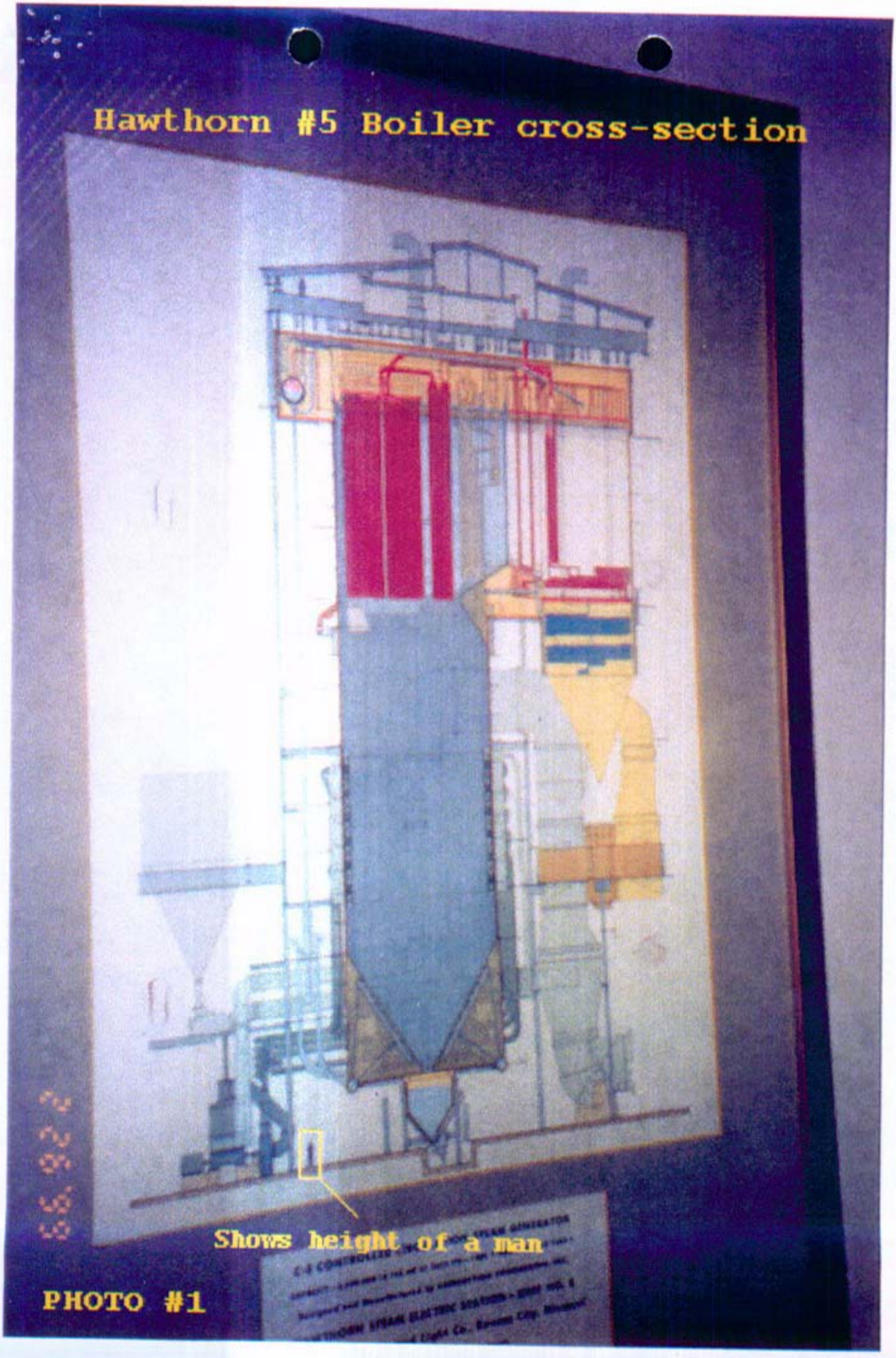
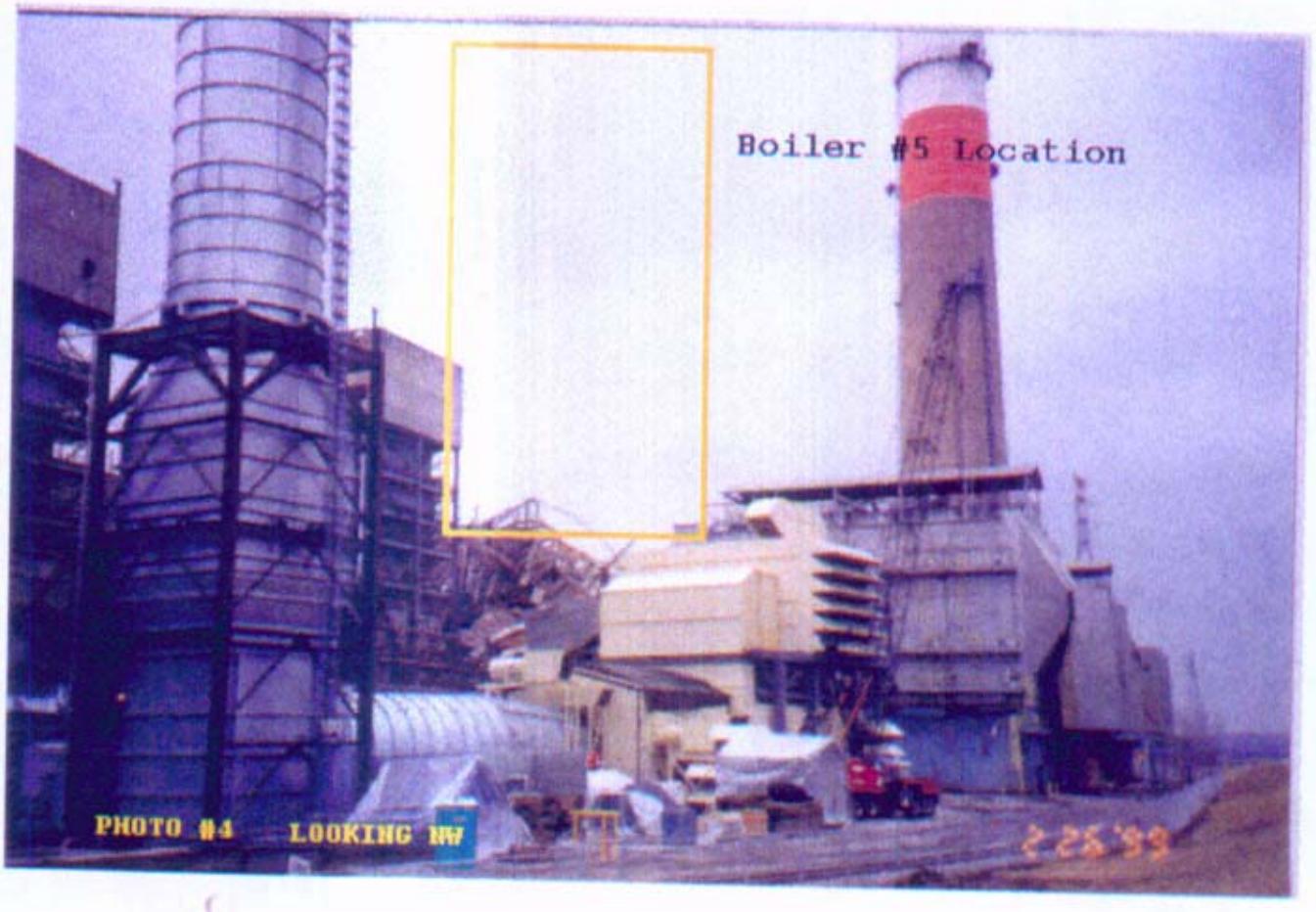


PHOTO #2


Hawthorn #5 Boiler cross-section
Shows height of a man
PHOTO #1


Boiler #5 after explosion
PHOTO #3 LOOKING SW


Cranes in process of removing
Boiler debris
PHOTO #5
LOOKING SW


Boiler #5 Location
PHOTO #4 LOOKING NW
2-25-99


Crane removing damaged boiler
PHOTO #6
LOOKING SW

Precipitator ductwork damage

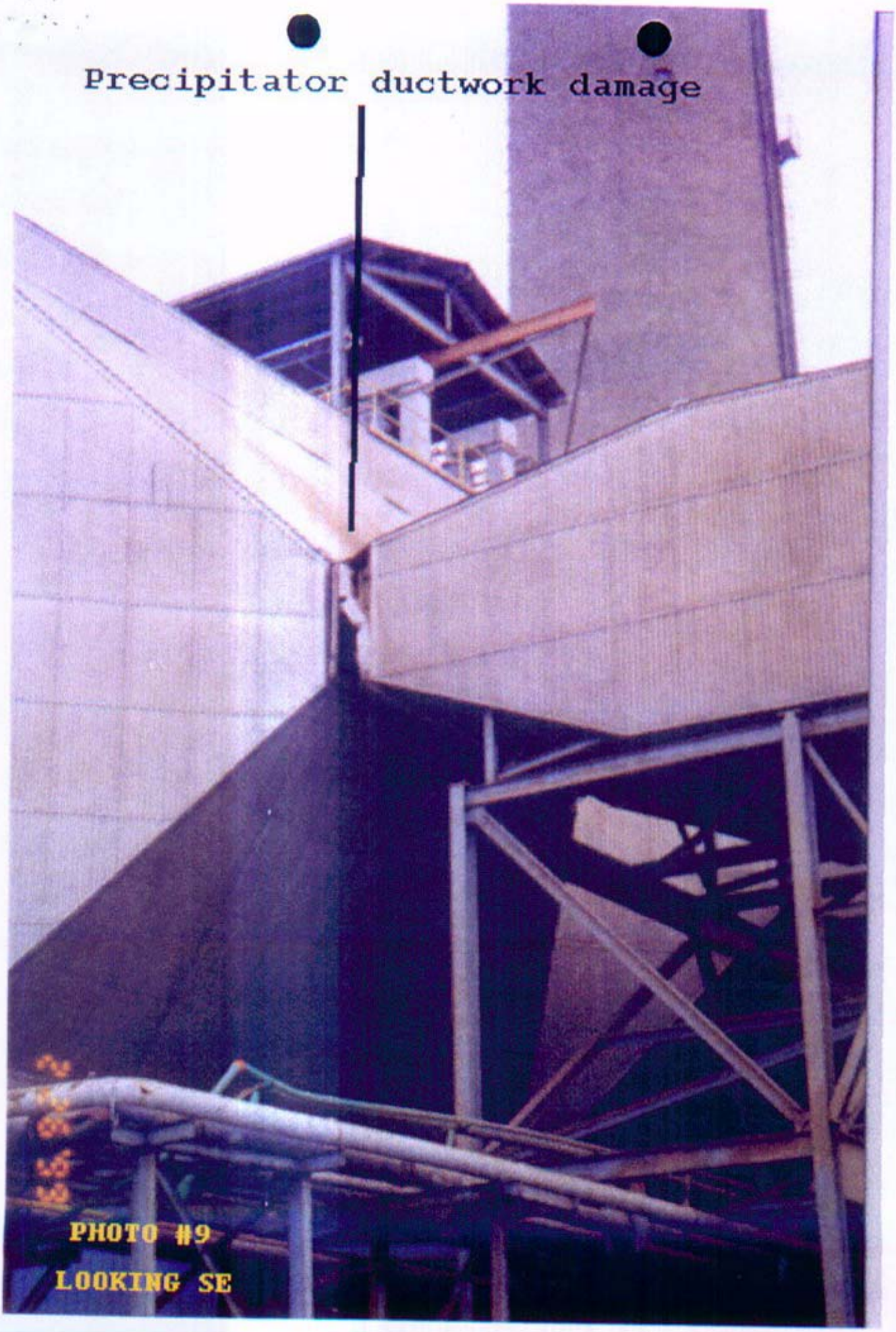


PHOTO #9

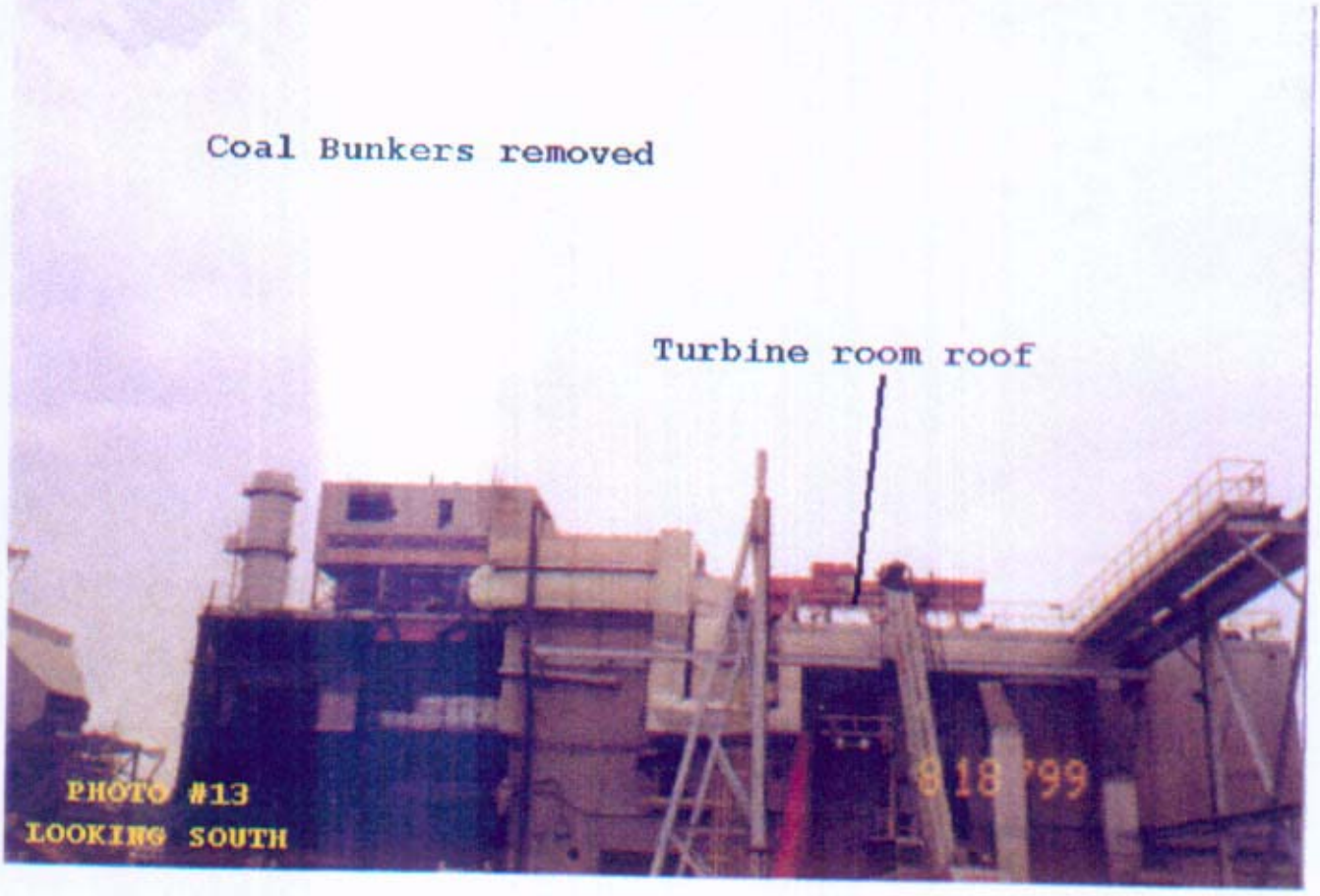
LOOKING SE


Coal Bunkers removed
PHOTO #12
LOOKING NE

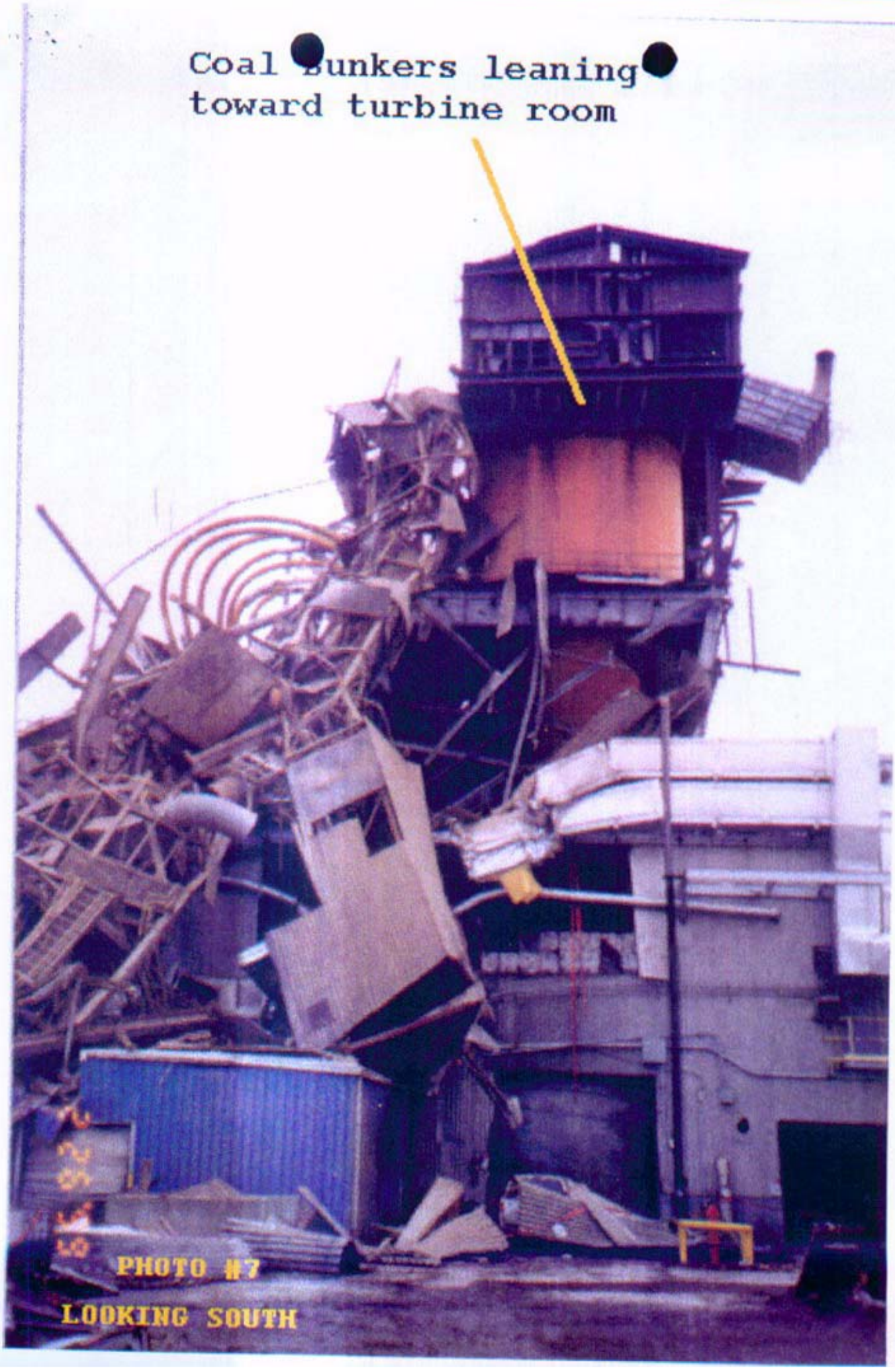
PHOTO #11

Corner burner removed
from damaged boiler

Coal Bunkers removed

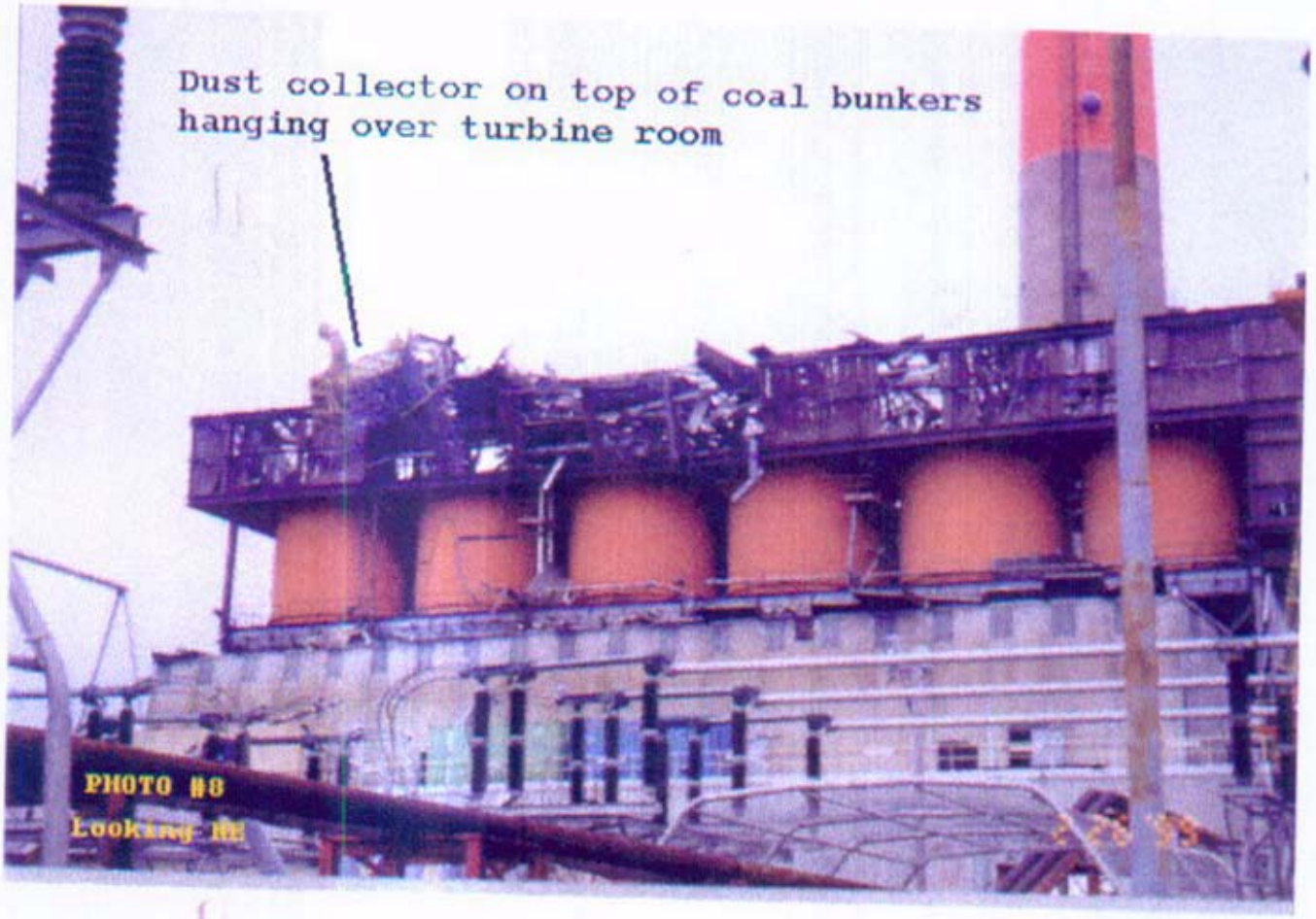

Coal Bunkers removed
Turbine room roof
PHOTO #13
LOOKING SOUTH


Coal Bunker structural steel
PHOTO #14
LOOKING SW


Coal bunkers leaning
toward turbine room
PHOTO #7
LOOKING SOUTH

Boiler removed

Coal bunkers removed


Dust collector on top of coal bunkers
hanging over turbine room
PHOTO #8
Looking NE

APPENDIX B

Boiler Data

Hawthorn #5 Boiler was manufactured by Combustion Engineering Company and supplied steam to a turbine manufactured by General Electric Company to produce approximately 470MW. The unit went into service on May 31, 1969.